HEARING TO RECEIVE TESTIMONY ON MILITARY SPACE PROGRAMS IN REVIEW OF THE DEFENSE AUTHORIZATION REQUEST FOR FISCAL YEAR 2011 AND THE FUTURE YEARS DEFENSE PROGRAM

WEDNESDAY, MARCH 10, 2010

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:42 p.m. in room SR–232A, Russell Senate Office Building, Senator E. Benjamin Nelson (chairman) presiding.

Committee members present: Senators Ben Nelson, Udall, and Vitter.

Majority staff member present: Madelyn R. Creedon, counsel.

Minority staff member present: Daniel A. Lerner, professional staff member.

Staff assistants present: Kevin A. Cronin and Paul J. Hubbard.

Committee members' assistants present: James Tuite, assistant to Senator Byrd; Ann Premer, assistant to Senator Ben Nelson; Jennifer Barrett, assistant to Senator Udall; Rob Soofer, assistant to Senator Inhofe; Sandra Luff, assistant to Senator Sessions; and Michael T. Wong, assistant to Senator Vitter.

OPENING STATEMENT OF SENATOR E. BENJAMIN NELSON, CHAIRMAN

Senator BEN NELSON. Good afternoon, and welcome to our witnesses this afternoon.

I apologize for the delay in the start. Votes always seem to get in the way of our regular business, and so we suffer through that, as we must.

We have with us this afternoon Gary Payton, Deputy Under Secretary of the Air Force for Space; General Robert Kehler, Commander of Air Force Space Command; Lieutenant General Larry James, Commander of the 14th Air Force and the Strategic Command Joint Functional Component Command for Space; Vice Admiral David Dorsett, Deputy Chief of Naval Operations for Information Dominance; Gary Federici, Deputy Assistant Secretary of the Navy for Command, Control, Computers, Intelligence and Space; and Christina Chaplain, Director, Acquisition and Sourcing Management, from the Government Accountability Office (GAO).

Welcome to all of you. Appreciate your being here.

Space is an essential element of almost every military operation. As various exercises and studies have demonstrated, including the Shriever series of war games, space provides a distinct and unique advantage to U.S. forces, one that they won't operate and can't operate without. But, as that advantage is becoming more well understood, more attention and leadership must be paid to protect space and the assets on orbit and on ground.

Improving Space Situational Awareness, and thus, improving the ability to protect space systems, is a major and welcome focus of the Air Force budget request for fiscal year 2011, and so, we look forward to working with you to sustain this much-needed focus.

After many years, years of discussing broken space acquisition programs that were years behind schedule and significantly over budget, it appears as if these programs have finally turned a corner. The Wideband Global Satellite system, WGS, now has three satellites on orbit, with more to come; the first of the 2F Global Positioning System satellites, GPS, which should launch in the next few weeks; the first Advanced Extremely High Frequency Communications Satellite should launch this summer; and there is a possibility that the Space-Based Infrared Satellite GEO system, SBIRS–GEO, will launch in late 2010 or early 2011. This is all excellent news.

But, there are still issues. The Navy Mobile User Objective system is about 2 years late, and the UHF Constellation that it will replace is increasingly fragile.

On the other hand, this week's decision to give serious consideration to an interim augmentation capability is positive. Launch costs have continued to increase, the space ranges need to be modernized, and there are growing concerns about the space industrial base. The operationally responsive space effort continues to wrestle with the challenges of establishing a responsive space capability, and small business still have difficulty bringing their innovative ideas to the table. Finally, the management coordination of space is fractured; some might even suggest, broken.

I look forward to hearing some of the ideas on how to improve that situation, as both the Air Force and the Office of the Secretary are actively studying this problem, as well as on all the many facets of operating in, from, and through space.

And we have quite a large panel this afternoon, a lot to cover. So, if we can, let's begin.

My ranking member, Senator Vitter, will be late—will be with us shortly, but all of our witnesses have prepared written statements, and those will be included in the record, without objection.

And we're ready to go. And because we have this large panel, if you—if we could, highlight just the major issues, rather than giving a long, formal, oral presentation, and then we'll move straight to questions.

And the order—we'll start first with Secretary Payton.

STATEMENT OF GARY E. PAYTON, DEPUTY UNDER SECRETARY OF THE AIR FORCE FOR SPACE PROGRAMS

Mr. PAYTON. Yes, sir. Thank you, Senator.

As you mentioned, I submitted a—for the record, I submitted my opening statement, and so, I will forego a verbal opening statement, in the interest of time.

[The prepared statement of Mr. Payton follows:]

Senator BEN NELSON. Thank you.

General Kehler,

STATEMENT OF GEN. C. ROBERT KEHLER, USAF, COMMANDER, AIR FORCE SPACE COMMAND

General KEHLER. Sir, thank you for inviting us.

I would just make a couple of quick remarks.

First of all, as an airman, I have to note that, earlier today, over in the Capitol Visitor Center, the Congressional Gold Medal was awarded to the Women Air Force Service Pilots—the WASPs—from World War II fame. And so, I would just note that, at the beginning of the hearing here. Our Secretary of the Air Force, Michael Donley—I'll paraphrase him, "We have a better Air Force today, because of the service that the WASPs gave, and the groundbreaking work that they did for all of us. So, I would just note that at the beginning.

Regarding space, it's a real pleasure for me to be representing the 46,000 men and women of Air Force Space Command. That's a mixed group of Active Duty folks. It's Air National Guardsmen, it is Air Force reservists, it is government civilians, and it is a key contractor team. And without that entire team, we would not be able to do the job that we are doing.

Everything that we do in our command begins and ends with the needs of the Joint Force commanders or the needs of the civil population or, in the case of GPS, that's really now a set of needs that we see from all over the world, and we take that responsibility very, very seriously.

We like to say, around our command, that space and cyberspace capabilities provide something important for our Joint Forces; they provide them with the ability to see with clarity, communicate with certainty, navigate with accuracy, strike with precision, and operate with assurance. That's a tall order for us. It's one that we take seriously and that we are proud to provide on behalf of the Joint Force.

The capabilities that we provide today are woven through the fabric of the Joint Force, and they're woven through our daily lifes. Farmers in Nebraska, of course, are, today, navigating their fields using GPS and other space products that they receive. This has become a way of doing business, certainly in the United States and elsewhere around the world.

So, that means that as space is becoming more congested and contested, we have to be more mindful of ensuring that those capabilities are available when they're needed.

That leads us to a space protection program that we've been very aggressive with over the last couple of years, along with our partners at the National Reconnaissance Office. And I think we're making good progress there. And I'd be happy to talk about that further as we go along.

And then, finally, I would just offer, sir, I think—I would agree with you completely, that we have turned some very important cor-

ners, but there is also no question that we have some very tough challenges ahead. I would offer my thanks to the committee, the leadership of the committee, the members of the committee, who have spent quite a bit of all of your time, over the last several years, number one, being patient with us, and number two, investing your own homework in understanding these issues and being very, very helpful as we worked our way through some tough issues.

I look forward to your questions, sir.

[The prepared statement of General Kehler follows:]

Senator BEN NELSON. I have to say, General Kehler, before we go to General James, you'll have to decide whether they were patient or acquired the appearance of patience. [Laughter.]

Anyway, we appreciate it. Thank you very much.

General James.

STATEMENT OF LT. GEN. LARRY D. JAMES, USAF, COMMANDER, 14TH AIR FORCE, AIR FORCE SPACE COMMAND, AND COMMANDER, JOINT FUNCTIONAL COMPONENT COMMAND FOR SPACE, UNITED STATES STRATEGIC COMMAND

General JAMES. Mr. Chairman, again, thank you for the opportunity to be here again this year.

As the commander of JFCC Space and 14th Air Force, I represent over 20,000 men and women around the world who really are responsible for conducting operations for all of our DOD space systems. Whether that's satellite systems, whether that's our missile warning systems, whether that's space surveillance systems, or our launch systems, these are the men and women that actually execute those operations and make sure that we get the job done, day in and day out—as General Kehler said, both for the military, the Joint Forces commander, and all the civil users and other users around the world that rely on the products we provide.

So, sir, we have a great task in front of us, but these men and women execute that mission every day, and they provide the support that the world needs from a space perspective.

I look forward to your questions.

[The prepared statement of General James follows:]

Senator BEN NELSON. Thank you.

Mr. Federici.

STATEMENT OF GARY A. FEDERICI, DEPUTY ASSISTANT SECRETARY OF THE NAVY FOR COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, INTELLIGENCE, AND SPACE

Dr. FEDERICI. Chairman Nelson, thank you for the opportunity to appear before you today with Admiral—appearing before you today with Vice Admiral Jack Dorsett to discuss our space programs and related—space-related activities.

MUOS is clearly our most critical space program. We have had some challenges, and I think we are looking for a way ahead. We were pleased to submit a report to you last week with some options that may help mitigate gaps in the future and support the on-orbit fragile Constellation.

So, thank you very much.

[The prepared statement of Dr. Federici follows:]

Senator BEN NELSON. Thank you.

Admiral?

STATEMENT OF VADM DAVID J. DORSETT, USN, DEPUTY CHIEF OF NAVAL OPERATIONS FOR INFORMATION DOMINANCE (N2/N6), AND DIRECTOR OF NAVAL INTELLIGENCE

Admiral DORSETT. Mr. Chairman, thank you for the opportunity to be here, especially on behalf of the men and women of the U.S. Navy. It's a privilege for me to be able to testify before you today.

I want to reiterate one point for you, that I believe you're already aware of, and that's that the U.S. Navy is critically dependent upon space. Our ships, submarines, aircraft operate across the farflung reaches of the globe, often operating independently. And the one thing that keeps them tied together, I think, is space-based capabilities, whether that's communications, the networks that support them, whether it's the navigation and precision geolocation data that comes from space, weather and environmental sensing information is absolutely vital to the U.S. Navy.

And then, also, truly, when it comes down to precision weapons, we need that detailed precision geolocation information that can only come from space.

Our intelligence resources, also, from space, provide a critical component of what the U.S. Navy's intelligence organization needs. And then, ultimately, I think the need for space to support our missile defense capabilities is on the rise.

I have two points to make. One is regarding MUOS. Dr. Federici has mentioned it, and you have, as well. MUOS is in the midst of another delay. Last year, you were informed that MUOS was going to be delayed by about 11 months. It looks like—our estimate at this point is that MUOS—the first satellite will now—is expected to be launched in September of 2011, with an on-orbit capability of December 2011. That's about a 10-month delay from what you were briefed previously. We can go into details regarding what the purpose or the reason for that delay is, if you'd like.

The other point that I'd like to make is to inform you that we do have a mitigation plan. You've received the report from the assistant Secretary of the Navy this past week. We do vigorously fund the mitigation plan. We are vigorously funding the MUOS capability itself to ensure that we deliver the entire capability. We are looking and working with the industry partner—our partners to mitigate the challenges that we face. It has our full attention, sir.

And, with that, I'm certainly prepared to take any of your questions.

[The prepared statement of Admiral Dorsett follows:]

Senator BEN NELSON. Sure. Thank you.

Ms. Chaplain.

STATEMENT OF CRISTINA T. CHAPLAIN, DIRECTOR, ACQUISITION AND SOURCING MANAGEMENT, GOVERNMENT ACCOUNTABILITY OFFICE

Ms. CHAPLAIN. Thank you, Mr. Chairman.

As you know, I'm focused on the acquisition side of space. And your opening statement covered a great deal of what I was going

to say, so I'm just going to emphasize a couple of points about the efforts DOD is making to improve space, and what we see are the remaining challenges.

I think a lot of credit goes to DOD for the wide range of actions they've been taking to improve their acquisitions. They include such things as strengthening cost estimating, strengthening testing oversight, contractor oversight, strengthening the requirements process, strengthening their acquisition policy. And many of these began before the most recent Weapons Systems Reform Act.

But, we're not really out of the woods yet; there's still a lot of challenges. And I think reform itself will take long time to produce results, just because space programs take a long time themselves. And we have very few new programs on the horizon.

Reform will also be difficult to achieve if the right bench strength isn't there execute space programs. And this includes technical and program experts. It's been very challenging for DOD to address gaps in the space workforce.

Likewise, reform will be difficult if there's gaps in the industrial base expertise, if there's lax contract management and oversight, if there's insufficient resources for testing new technologies, and, as you mentioned, if we can't get innovation in the form of our small businesses into the programs. All these issues, we've identified before as needing attention.

Moreover, there are still a lot of questions that need to be resolved about how space should be best organized, led, and supported. Studies concur that there's a need for stronger centralized authority for space, and our own studies consistently show space programs have difficulty coordinating their ground, user, and space components, as well as getting agreements on requirements that cross boundaries. Moreover, without a central point of accountability, it may be difficult to sustain reform efforts underway.

With that, I would like to just conclude and say, I look forward to the questions you have.

[The prepared statement of Ms. Chaplain follows:]

Senator BEN NELSON. Thank you.

Mr. Payton—this really goes to Mr. Payton, General Kehler, and Admiral Dorsett. In 2001, the Space Commission established, in the fiscal year 2000 National Defense Authorization Act, to review the management and organization of space, and it concluded that a number of, quote, "disparate space activities should be promptly merged, chains of commands adjusted, lines of communication opened, and policies modified to achieve greater responsibility and accountability." That's the end of quote.

In your respective views—here we are, 9 years later—has the situation changed since the Commission made this finding? Is it—and if so, is it better or is it worse?

I guess we start first with you, Secretary Payton.

Mr. PAYTON. Yes sir. A lot has changed since 2000 and 2001: establishment of the Director for National Intelligence and the assignment of the National Reconnaissance Office to that Director; the acquisition rules that were established as a result of that 2001 legislation have been changed again, and now space programs are back under the standard, routine acquisition policies that the rest of the Pentagon abides by.

There's been a myriad of changes since that 2001 era. And recognizing that, Secretary Donley, back in December, asked Mr. Rich McKinney, an experienced Air Force employee, to look at how Air Force Headquarters should be organized, in light of all these changes since 2001. The results of Mr. McKinney's analysis will go to Mr.—will go to Secretary Donley in late March, early April. He's—Mr. McKinney has talked to 56 people so far—surveyed 56 people, to include Congress and the Army, Navy, Air Force, all across the country. And so, he has collected a wealth of data and is distilling that into some recommendations for Secretary Donley to consider.

So, we are responding to all the changes that have occurred since 2000 and 2001. And Secretary Donley will have that to digest here, within a few weeks.

Some of those—some of the potential suggestions do include help from Congress, and so, we will be fully open and transparent with Congress as we—if we decide to move down certain paths.

Senator BEN NELSON. General Kehler?

General KEHLER. Sir, I would offer that, in the management of space activities, there are two major and complementary segments that we have to look at. One is the operational segment, and the other is the acquisition segment.

For operations, I would say, unequivocally, we are far better today than we were in 2001. It is clear who is in charge of our space operations, and that begins with the President giving the mission responsibilities to the Commander of U.S. Strategic Command, who, in turn, has—his predecessors have established the functional component for space. It's a joint activity, where we have now pulled together the operational pieces of what used to be a fragmented activity. And I think that now 6, 7, or more years of combat experience have helped hone how we do space operations. And so, my take on this is that, in the operational side of this equation, we have made great strides, and we are far better for it today.

On the acquisitions side, I think I would give us a mixed review. In my own command, for example, Air Force Space Command, as a result of those—of that committee's work in 2001, I now have a hybrid major command in the Air Force. I have a command that has responsibility to organize, train, and equip space forces to give to General James—to General Chilton at Strategic Command, but I also have an acquisition arm inside Air Force Space Command; I'm the only one of the Air Force major commands like that. And that was done specifically so we could pull operations and acquisition and requirements, from a four- star perspective, all together, and to make clear where the accountability and authorities were in all of that. And so, in that regard, I think that we have also come a long way inside the Air Force.

The question now is, in light of the changes that Secretary Payton mentioned, Are we where we need to be? And I think that's where this review that Secretary Donley has begun is good and it's timely. And we'll look forward to discussing this with the Secretary as we go forward.

Certainly, there are some places where we still have work to do in all of this management area. The question is, in light of the

changes that occurred since 2001, how best to go forward. And we are participating in that study. It's focused inside the Air Force, but, of course, it has implications for other things, as well, and we're looking forward to that being completed.

Senator BEN NELSON. How would that relate to policy? I understand operations. I understand acquisition. But, what about policy, to make sure that the overall picture is complete and all the pieces are in place, or what it takes to put all the pieces in place—operational, we understand how that works; we understand how acquisition goes. But, somebody has to truly be in charge to make all those decisions and see the—see how each and every one of these pieces fits together to make the picture. What would you say to that?

Mr. PAYTON. Yes, sir, I would offer, that is part of the charter that Secretary Donley laid out for this comparatively short study. So, that sort of—how we relate to the rest of the Pentagon—OSD—how we relate to the other services is part of the scope of that study.

Senator BEN NELSON. All right.

Admiral Dorsett?

Admiral DORSETT. Mr. Chairman, I agree with General Kehler, that, on the operations side, there is great progress and improvement that's been made, in terms of operational management and oversight of space activities. But, I also share, I think, your concern that it's not just policy, it's not just acquisition, but it's the resources and how that is managed across the Department of Defense. And while I'm probably a little bit I'm probably a little bit out of my lane here, from my vantage point, there is a fair amount of different players, with different roles and responsibilities across OSD, and it is not as clear to me that this is, perhaps, necessarily, the perfect organizational alignment. Whether it's within the secretariat of OSD itself or whether it's within the Joint Staff, there are different players, different organizations that have responsibilities. And it could probably be tuned up a bit.

In terms of the Navy, I do want to bring to your attention, within the last year, the CNO—Chief of Naval Operations, Gary Roughead—has made a couple significant changes that have streamlined Navy's focus on space and its management of space.

In my office, the Deputy Chief of Naval Operations for Information Dominance, he's assigned one individual responsibility for space. We had multiple flag officers on the Navy staff, previously, that had responsibility for space.

In the fleet, he stood up the 10th fleet. The commander of the 10th fleet, a three-star admiral, is now the one individual who's responsible for space, operationally, for the Navy. And then, in the secretariat, my compatriot, Dr. Federici, has that responsibility. So, we've streamlined our organizational alignment, and we're already seeing the benefits of that in the dialogue.

We've got some actions to take to actually make some additional progress. But, the alignment, organizationally, I think, has been very positive for us.

Senator BEN NELSON. Thank you.

Senator Vitter.

Senator VITTER. Thank you, Mr. Chairman.

Thank you all for your testimony and service.

And I apologize I was late because of other meetings.

General Kehler and Mr. Payton, I want to focus on States and the potential impacts of NASA budget changes to what you do. The Evolved Expendable Launch Vehicle certainly assures our access to space and has a remarkable success record, is a real workhorse. But, as we all know, assured access to space is not cheap, and the cost is trending up. And in that context, I want to understand what you think the decisions, just announced with regard to NASA—if they, in fact, become policy—to retire the Shuttle very quickly and, even more significantly, cancel the Constellation program—How will that affect future launch costs that you deal with? If you all could offer your thoughts on that.

Mr. PAYTON. Yes, sir. In fact, on February 1st, I called a dear friend of mine, Bill Gerstenmaier, over in NASA headquarters, and he was very open to work with the Air Force and the entire Department of Defense as NASA puts together their plan for the future.

Clearly, a—we share an industrial base with NASA. We share an industry workforce with NASA. That industrial base is, in many places, not healthy. And concentrating more flights per year in the EELV program would possibly help us in acquiring the elements of a launch vehicle—the piece parts—the components. But, we have to be very careful and understand and manage that relationship very closely, because what we would not want to have—it would not be beneficial for either organization to have a unique EELV for NASA applications and a unique EELV for DOD applications. That would aid neither agency.

And so, if EELV does become part of NASA's future, either through government flights or commercial flights, we would have to watch very closely any design changes, any production line changes of that sort of detail, work very closely with NASA to understand and make sure we both end up with a better product.

Senator VITTER. Let me back up, because I was really focused on something a little different.

Mr. PAYTON. Okay.

Senator VITTER. Maybe the more direct way to ask my question is this. NASA—this administration want to cancel the Constellation program. Does that have an impact on you all? And, if so, what is it?

Mr. PAYTON. Again, we are still—tomorrow, I have a session with several NASA folks, and NRO folks, to understand their immediate and longer-term future for the cancellation of Constellation and so that we can learn what the ramifications and the ripple effect could be. But, again, that's a relationship we intend to manage and understand very closely. And, again, NASA has been very cooperative with us.

Senator VITTER. General?

General KEHLER. Sir, in looking at the NASA decision, first of all, we were asked, by the Augustine panel, to provide some input prior to the decisions, which we did. And in that assessment that we provided before the decisions were made, we listed almost two columns. Column one was a set of what we saw as opportunities. And, as you look at the NASA decision today, the investment that is planned there, in terms of research and development for a new

liquid engine, is a good opportunity that we think we would very much like to collaborate with them. And we see that as a good opportunity for the country, going forward. We see that their desire to improve the launch infrastructure—especially on the East Coast, related to the Kennedy Space Center, where we and the Air Force Adjoin at Cape Canaveral Air Force Station—we see that as a benefit.

We also see an opportunity, here, with the increased demand on commercial activities. We have said for a very long time, that part of our "assured access to space" plan includes commercial launch vendors that are viable. And so, this pulling on commercial, we also think is a positive thing.

On the challenge side, though, there is a challenge, here, regarding solid rocket motors, and that's the most immediate challenge that we see. The largest demand today, on the solid rocket motor industrial base, comes from NASA, although the Department of Defense, the Air Force, and the Navy, as well, rely on that same industrial base for both the land-based and the sea-based strategic deterrent, for other launch-vehicle solid-rocket strap-ons, for example, that we need for EELV and other things. And so, part of the review that's now going on, that Mr. Payton is heading, is, in fact, drilling down into that area of concern that we have, to find out whether that's a real concern, or whether it is not. And I can't give you the details of that today, because what we recommended prior to the decision was, if this is the decision that's made, we will then have to go off and sit down and take a hard look at what the implications will be for the industrial base. And that is where we stand today.

We don't have answers yet. What we do have is a potential concern. And perhaps it turns out not to be a concern, but we don't know that yet.

Senator VITTER. Let me explore that a little bit, because I don't understand how it wouldn't be a concern, at the end of the day. I mean, as I understand it, for solid- rocket stuff, there's a set industrial base that, right now, is supported—majority from NASA, minority from DOD. If that majority support from NASA goes away, and you still need to have and depend on that industrial base, I assume your costs go way up, absent some other help or some other factor. Am I missing something?

Mr. PAYTON. I don't know. And that's the issue. I mean, the obvious—that would be an obvious concern, but I don't have facts that say that is, in fact, what will happen. I don't know what will happen. And so, I think what—we need to pursue the course that we are on, here, which is, we have people off studying this, working with NASA, working with the rest of the partners that we have, to make sure that we understand it.

Senator VITTER. Okay. Some initial estimates are that the booster cost, because of what I'm describing, could go up as much as 100 percent. Is that within the realm of possibility, based on what you know now?

Mr. PAYTON. Our—the information we've seen is that the propulsion systems for our EELVs might double in price—double—

Senator VITTER. So, that's the—

Mr. PAYTON.—not the whole launch vehicle, but the propulsion—

Senator VITTER. Hundred percent for those propulsion systems.

Mr. PAYTON.—which is both solid propellant and liquid propellant rocket engines.

Senator VITTER. Okay. And so, in fact, your admittedly early estimates would confirm a sort of 100- percent figure for that category.

Mr. PAYTON. For that specific part of the EELV equation.

We're also looking at different ways to buy EELVs. That could perhaps save costs.

Senator VITTER. Okay.

Mr. PAYTON. There's a wealth of studies that we're doing right now to look at what should an EELV cost; a should-cost study.

Senator VITTER. And that look includes this block-buy approach?

Mr. PAYTON. Yes, sir. Yes, sir.

Senator VITTER. Okay.

If I can switch gears, quickly—and you may have covered this already, to some extent; I apologize, if you did. But, there is concern, as you know, about not having a designated executive agent for space or Space Posture Review, even as we make, you know, major investments—nearly $11 billion in fiscal year 2011. Who, within DOD, is ultimately responsible for developing and coordinating that sort of departmentwide space strategy?

Mr. PAYTON. The Space Posture Review was conducted with all elements of the Department. It was led by the Office of Policy—Office of the Secretary of Defense that handles policy—

Senator VITTER. So——

Mr. PAYTON.—for the Space Posture Review.

Senator VITTER. So, the person—the entity responsible for leading it is that office?

Mr. PAYTON. For the Space Posture Review, yes, sir.

Senator VITTER. When will the Secretary designate an executive agent for space?

Mr. PAYTON. Secretary Donley has asked a Mr. Rich McKinney, very experienced Air Force individual, to look at how the Air Force should be organized, in light of many changes that have occurred in the past decade, relative to the authorities and responsibilities of the executive agent for space. And so, that—Mr. McKinney's report, again, will be delivered to Secretary Donley in late March.

Senator VITTER. Okay. And compared to that timing, what's the status—current status of the Space Posture Review?

Mr. PAYTON. The—there will be an interim report that comes to Congress that, I understand, has been signed by the Department of Defense representative, as of today. And then the Office of the Director of National Intelligence also has to sign that interim report. And then it can come over to Congress.

Senator VITTER. And will that final version be done in time to inform the fiscal year 2012 budget within the Department?

Mr. PAYTON. The interim report clearly will be. The final summation of the Space Posture Review will not be available until after the White House finishes a national space policy update.

Senator VITTER. Okay.

Ms. Chaplain, sort of related to this, your testimony ties diffuse leadership to acquisition problems. What, exactly, do you mean by "diffuse leadership," and how do you think it's affecting programs?

Ms. CHAPLAIN. I think—in some of the programs we review, it becomes unclear if there's a real person in charge or a single point of authority to resolve conflicts and gaps in coordinating assets.

So, when we looked at the GPS program, for example, we found disconnects between the ground segment, the space segment, and the user terminal. And sometimes these gaps added up to years. So, our question is, Who's the person in charge to kind of resolve these gaps and make sure resources are dedicated to where they need to be? And we never really found that kind of single point of accountability. We're looking at space situational awareness now, and some of those questions come up again, like, Who's really the point person for space situational awareness? And it's so broad, and it covers so many organizations.

And that—just what tends to happen in space, because there are so many players. Even outside of DOD, there's an intelligence community, there's NASA, there's NOAA—you know, any number of players involved in any one project. Who's the one that brings it all together and has a strong say in what's going on in these programs?

So, the—what we have found in these individual programs—I think it's echoed, in a large sense, in some of these studies that have been done per various congressional mandates.

Senator VITTER. Okay.

Mr. Chairman, if I could just—

Senator BEN NELSON. Sure.

Senator VITTER.—hit one final topic, which is NPOESS.

If I can turn to the Air Force leadership. Did the Air Force help initiate the decision to divorce NPOESS? What was your input into the process that led to that decision?

Mr. PAYTON. The Air Force participated, along with OSTP and NOAA and NASA and the National Security Council, to put together the White House decision on NPOESS. And so, we—

Senator VITTER. And what was that input? I mean, was the decision—was the route that was taken—did it, in part, come from you, or was it enforced on the Air Force?

Mr. PAYTON. It was a decision that OSTP made and National Security Council made. And—but with multiple inputs from the Air Force on alternative future programs. Our—or, what would—if the programs stayed together, what would the future look like? And so, our job was to offer technical advice and warfighter needs, and to offer the potential ramifications of certain decision paths.

Senator VITTER. Did you have a—did the Air Force have a fundamental opinion whether its interests would best be served with a divorce, or not?

Mr. PAYTON. We deferred that to the White House—National Security Council.

Senator VITTER. What steps are being taken to ensure that Defense recoups the technologies it has already funded?

Mr. PAYTON. In fact, the OSTP and the National Security Council sent all the participants a letter defining the near-term immediate steps to do, which—we helped put that letter together, and it includes harvesting the sensor technologies and gaining access to all the intellectual property that is necessary for future designs. So, we will have access to all of that.

Our initial step, though, is to do—is to work with the Joint Chiefs of Staff and do a military user requirements scrub to determine what the best requirements are for the warfighter that the Air Force would then design into a successor spacecraft for our part of the weather picture that we are responsible for, which is one of the three orbits; the Air Force will field the systems necessary to satisfy one of the three orbits that everybody needs.

Senator VITTER. Okay.

Final question, jumping back to NASA-related issues. Obviously, canceling the recommendation, which is not law yet, of canceling Constellation is a big, major departure from the past. Was the Air Force explicitly asked the impact on you of canceling Constellation before the decision was made?

Mr. PAYTON. No, sir.

Senator VITTER. Okay.

Thank you, Mr. Chairman.

General KEHLER. Sir, may I clarify—on the executive-agent question that you asked, just one other point?

Senator VITTER. Sure.

General KEHLER. Because I sensed, in the question, that maybe there is a view that there is not an executive agent today. That is not so. The directive that implemented the Space Commission's recommendation about an executive agent says that the Secretary of the Air Force will be the executive agent. And then the Secretary can delegate that to the Under Secretary. Without an Under Secretary, we haven't delegated that authority anywhere, but the Secretary himself is still the executive agent for space for the Department of Defense.

He has three primary responsibilities in that job: plan, program, and acquire. Policy and—space policy has always been under the purview of the Under Secretary of Defense for Policy. Just for clarification.

Senator VITTER. Well, General, my reaction to that would be, you know, you can have a piece of paper that says the President of the United States is the executive agent, but that obviously wouldn't be meaningful, given his other responsibilities. And to a—admittedly, to a lesser extent, my response to that would be, it's the same problem with the Secretary of the Air Force.

You—do you have a response to that?

General KEHLER. No, sir. I understand exactly what you're saying. I just wanted to make sure—I thought that what you were saying was that there was not an executive agent. Technically, there is.

Senator VITTER. Thank you, Mr. Chairman.

Senator BEN NELSON. Thank you, Senator Vitter.

Ms. Chaplain, last year, the GAO issued a report that resulted in some significant and very negative press coverage about the health and reliability of the GPS system. Could you update us on the GAO's assessment, now, of the GPS system?

Ms. CHAPLAIN. Yes. We're currently conducting a review—a follow-on review. And the two programs we looked at, on the satellite side last year, were the IIF program and the IIIA program. And the IIF program has made some progress, and it's getting ready for a launch fairly soon.

The IIIA program is on—it's meeting its schedule currently. We still have concerns about the compressed nature of the schedule, and all the very difficult activities ahead for GPS IIIA, but it is not encountering any severe problems at this point.

When we look at the health of the Constellation, our findings are pretty similar to last year's. One thing we weren't discussing in last year's report, that should probably brought out more when we talk about it this year, is some of the options the Air Force has available to it to manage GPS if they do have—experience some dips in the Constellation availability. There are options that they have to get through those periods.

Our concern is, you just—you don't want to find yourself in a state where you're looking at those kind of options; you want to make sure you do everything you can to keep the program healthy, resourced, and on track.

Senator BEN NELSON. One of the key impacts to the Air Force looks to be the EELV upper-stage engine. The infrastructure cost may double, as we understand it, for the Air Force, because the—because NASA has stopped buying these engines. Dr. Payton, General Kehler, could you enlighten us on this?

Mr. PAYTON. Yes, Senator. That's part of the propulsion doubling end cost that we have seen. We haven't experienced it yet. We—it's been predicted. And it's both the upper-stage engine, called an RL–10, and the first-stage engine, called and RS–68, on one of the EELVs.

The company that makes those two rocket engines has shrunk its overhead, facility-wise, by 50 percent in the past few years, but with the drawdown of the Space Shuttle main engine, which that company also produces—works on; and the cancellation of a rocket engine called the J2X, which is part of the Ares launch vehicle. If that does come about, even though they've already reduced their overhead dramatically in the past few years, there—they will still have more overhead, more facility space than they need to produce those two rocket engines—the first- stage engine and the second-stage engine. And so, that's, again, part of the industrial-base ramifications that we've got to manage very tightly.

And, additionally, it's—part of it is, the flight rates for these two rockets—the EELVs—have not materialized, due to a drawdown in commercial launch sales. And so, the—that's been part of the problem, too; just not enough rocket engines being built to—compared to what the original plans were.

Senator BEN NELSON. Well so, that puts us at a disadvantage of some sort. Is it just economic, or is it the potential of not being able to have parts or replacement or anything that would relate to continuity?

Mr. PAYTON. The first word out of my mouth, when I talk to either the Air Force folks or the industry folks, when it comes to launch, is reliability. We cannot afford a failure in a launch. So, we will not do anything that sacrifices reliability. And—but what we have to do—and we have, again, six studies ongoing right now, all the way from mission assurance to detailed should-cost studies, to looks at how much manpower the industry is charging to the EELV program. So, we've got a series of six studies going on right now to look at how we can maintain the mission assurance, maintain

the reliability, and reduce these costs that we're seeing on the horizon.

Senator BEN NELSON. And, Dr. Payton—or, Secretary Payton, the Air Force reconfigures and uses excess strategic assets for space launch. I understand there may be some issues arising, from a competition perspective, with regard to the use of these assets. Is there a way to save money, with respect to the assets, and avoid destruction costs? Does the Air Force have a view on this?

Mr. PAYTON. These rockets that are—that use excess ICBM stages—they're called Minotaurs, and there's four different sizes of Minotaur. We—every time we use one, we get Secretary of Defense approval to do that, for that very reason. But, these launchers launch satellites that are much, much smaller than what EELV rockets can launch. And so, it's a different class, a different, almost, market space, a different market for these class of launchers, compared to EELVs.

Senator BEN NELSON. All right.

Ms. Chaplain, you mentioned, in your testimony, that one of the problems facing DOD in the future is a lack of adequate engineers and technicians with space experience. Is this a problem not only with DOD, but is it also just a general problem in the industry, as a whole?

Ms. CHAPLAIN. Yeah, I think it is a general problem. The one thing to note is that NASA has some special flexibilities, in terms of hiring people and retaining them and recruiting them, that the DOD may not have on the space side, but, generally, in aerospace, I think there's an increasing shortage in key technical expertise, that everybody's dealing with.

Senator BEN NELSON. From the standpoint of the Air Force—and perhaps from the Navy, as well—Secretary Payton and Dr. Federici, could you give us some idea of your experience in being able to field technically competent engineers? And while we may have it under control at the moment, or getting it under control, what's the future hold?

Dr. FEDERICI. Well, within the Navy, we have the Naval Research Lab, and they are—they have been in the space engineering, space science, and technology for well over 50 years.

Senator BEN NELSON. Does that mean you're growing your own, in effect, or—

Dr. FEDERICI. We use the NRL as pretty much a pipeline to grow engineers, on the civilian side. And we've—also have a military cadre there, as well, that augments it.

We also have a very strong Navy element at the National Reconnaissance Office, and we have had that element for a long time. I believe we have about 240-plus people out there, all participating in acquisition programs. We also hold leadership positions out there. Admiral Liz Young is the systems engineer for the National Reconnaissance Office. We also have Andrew Cox, who runs their Communications Directorate. So, those are the key areas where we try to grow our people, and especially the people in the NRO—mostly military—and a civilian segment, as well. We try to take the military, and try to move them back to the fleet, when we can, bring them back into space, as well, so that we always are bringing

the fleet views of space support within this technology arm of the National Security Space Office.

Senator BEN NELSON. Secretary Payton?

Mr. PAYTON. The Air Force has something called an Acquisition Improvement Program for not just space, but across the board—air and space and cyber. Part of that is hiring 900 new acquisition personnel for space itself. And we're already in the midst of—we've already brought on over 50 of those 900. That 900 will spread over the course of a few years. So, that's on one end of the spectrum, where we're attracting, into Air Force space, folks who are already skilled in space acquisition engineering.

And on the other end of the spectrum, brandnew lieutenants. The Air Force Academy has a superb astrodynamics department, where the cadets actually design, build, and fly satellites. So, we're working the problem on both ends of the career spectrum.

General KEHLER. Mr. Chairman, if I could add—

Senator BEN NELSON. Sure.

General KEHLER.—from the perspective—since the Space Missile Systems Center is in Air Force Space Command—over the last year, or a little bit more now, we have seen a sharp increase in the number of young people coming out of college who are interested in coming to work at SMC, to the tune of almost 300. Now, there are reasons for why they are there. It has to do with the economy and some other issues, of course. But, nevertheless, that's about 300 young people that we would not have had otherwise. And we believe that—given the nature of the work that they will do there, and the fact that many of them were interested in interning with us before they actually came to work for us, we think that we will retain a sufficient number of them, or a high percentage of them. That's good news for us, and that's one of the brightest spots that we've had in a number of years. So, that piece is good.

I think the experience level of our program managers is going up. We have committed to keeping some of our program managers in place longer, for example, than we had in the past, and I think that's paying some dividends, as well. And so, working through this Acquisition Improvement Program, I think that we have seen some strides here. The question is whether we can sustain that. When we look at our presence—the Air Force presence at the National Reconnaissance Office, as well, which has been a very large presence over the years—we also see more experience there, and, in fact, some additional program management opportunities and other things out at the National Reconnaissance Office, as well.

So, the two places where we procure most of the Nation's national security space devices—Air Force Space Command and the National Reconnaissance Office—I think we have seen some improvements here over the last year or two.

Senator BEN NELSON. Mr. Secretary, over 80 percent of the satellite communications in Iraq and Afghanistan are handled by commercial satellites, and most of this capacity is purchased on an annual basis and funded through the supplemental or contingency operations funding. In your view, should there be a more strategic approach to buying commercial communications? And what's the right mix of commercial and military capacity?

I—perhaps, General Kehler, I would begin with you.

General KEHLER. Mr. Chairman, there should be a more strategic view about how to go forward. There is no question that satellite communications is one of those places where we rely very heavily on what commercial can provide; and, as you say, we essentially buy it by the pound.

As we look to the future, of course, we have tended to provide the very high-end protected communications kind of the things; the Navy does UHF for tactical and operational purposes; we've now been launching the wideband global service satellite. But, we still see room in the future for commercial, and one of the issues that has been taken on in the space posture review is, What should that mixture look like, as we go forward?

At the same time, we are also looking at what the architecture should be, as we—with the cancellation of TSAT, as you mentioned in your opening remarks, sir—with that cancellation, What does that mean for the future of protected satellite communications and this mixture? And we are back, looking, again, to revalidate our requirements, so that we can understand what that mixture should be as we look at the future.

Senator BEN NELSON. Okay. Thank you. I think that will suffice there.

Senator Udall.

Senator UDALL. Thank you, Mr. Chairman.

Senator BEN NELSON. Thank you.

Senator UDALL. Panelists, thanks for taking time to join us today.

Welcome, General Kehler. I know you took the medium- length journey from Colorado to join us today; and understand you, in part, came to be a part of the wonderful ceremony we had in Emancipation Hall, with the WASP pilots. It was moving and inspirational.

My mother was a pilot. She was inspired to become a pilot both by the example of Amelia Earhart and the WASPs. And I remember, fondly, her throwing three or four of her children, including me, into the airplane, and off we went, in Arizona.

And I'm reminded, Mr. Chairman, when—and Ranking Member Vitter—when we want to come together, it seems to be the American women that bring us together. And it was very, very inspirational to be there today.

Let me, if I might—and, Secretary Payton, turn to you, as well—to talk about NPOESS. I now understand we're calling it the Joint Polar Satellite System, and that seems to be an important step, perhaps, to, as we move to reconfigure what we do, rename it, as well. I've watched it—its progress, or lack thereof, in some cases, both in the House and now in the Senate. The budget's ballooned, the schedule's slipped. But, I was encouraged by the President's decision to separate the acquisition responsibilities and move away from that tri-agency management structure that a lot of reviewers, independent and internal, said was, in part, why we had some troubles.

So, I think we've got the beginnings of a workable program. I'm going to continue to follow its progress and look to you all for leadership, in the Air Force. I'll let—give the Navy a pass, for the time

being. But, this is so important to have this continuity of weather and climate data.

We haven't heard a lot of detail about the—in the direction that we're going to take, so I'd appreciate if you'd share what you know of the timeline, the expected requirements for the morning orbit, how you plan to determine them, and—in other words, Will the legacy capabilities of the DMSP satellites be sufficient, or do you need capability along the lines of the NPOESS satellites?

A lot of questions, but I'll yield time to you all to share your thoughts.

Mr. PAYTON. Yes, sir. Part of the stress and strain inside the NPOESS program was a desire for both Earth science climate data and operational weather observations to come off of the same platform. That's difficult to do from an engineering perspective, from a sensor resolution perspective. That's a difficult design systems engineering task. And that's really why the program was delayed as long as it was. And I think, fundamentally, that difference lies at the split of the program. For Earth sciences, that afternoon orbit is the best orbit for observing for Earth sciences purposes. For military operational weather observations, the early morning orbit is the best orbit. And so, that logic sort of played into that division of responsibilities.

We are still going through the details of what sort of requirements—military requirements would be necessary for that morning orbit. Joint Chiefs of Staff are doing that for us. Clearly—the good news is that we've got a large workforce, both in industry and the government; operators and acquirers that are familiar with this mission area. We don't have a learning curve with the people who are doing this, and so everything should be accelerated in that regard.

So, we—again, we're going to confirm military requirements for the morning orbit and fold in any other Earth science requirements that may be satisfied in that orbit. But, predominantly, the requirements scrub will be followed by acquisition decisions about which sensors we need, on what size platform, and then we can do the appropriate budgeting and—mostly an fiscal year 2012 sort of impact—fiscal year 2012's FYDP.

General KEHLER. Sir, I would just add, we have two DMSP—Defense Meteorological Support Program—satellites left, and so, we have a little bit of flexibility here. We are faced with decisions that we have to make, but we don't have to make them today. We have to be deliberate about how we make those decisions. And I think that's what Secretary Payton is suggesting, that we are on a pathway to make some deliberate decisions here.

Every review panel that looked at our acquisition programs over the last, maybe, 10 years that I've been paying really close attention to this in leadership positions, has cautioned us against trying to do too much on any one given platform. And I think that's what Secretary Payton was just saying, as well; these are very difficult integration issues, when it comes to that.

And so, at this point, the thinking is that we will still have a shared operational structure that will surround these various weather satellites, but that the acquisition will be placed in the right places for the right tasks. And now it's important for us to

figure out what those "right tasks" are to put in the acquisition houses that are best set up to do those, and make sure that we can do that in a timely way, harvesting the technologies that have already been paid for, essentially, through the development of the NPOESS program.

So, we now have to go do our homework and make sure that we understand what best way to go forward here so that we're not repeating any mistakes that have been laid out for us very capably and very painfully by a lot of the acquisition reviews.

Senator UDALL. Can and should we continue to ask you some hard questions about all of this as you reconfigure and make these decisions?

General KEHLER. Absolutely, sir. Absolutely. [Laughter.]

Yes, sir.

Senator UDALL. I know I have the support of the Chairman in that regard.

If I might, Mr. Chairman—you cut me off if my time expires—but I had two other questions.

I'm excited about the restructuring of the National Security Space Institute and the construction that will begin to house it and the Advanced Space Operations School at Peterson. I'm a homer in that regard, just like Senator Nelson is for his State.

You talked, I know, in your testimony, about the synergy between space and cyber, and I know that was a part of why the 24th was located under Space Command. And I'd like you expound a little bit more about those lessons and how you're gaining from the synergies that are in front of us.

General KEHLER. Yes, sir. Well, first let me offer that, again, some 7 or 8—well, I guess almost 9 years ago, when the Space Commission reported that we needed to do a better job preparing our space professionals, one of the outputs of that was to construct what is now known as the National Security Space Institute to do continuing education, if you will; postgraduate-level education for our space operations people, for our space acquisition people, for our space intelligence people, et cetera; space weather people and others who are all now part of that cadre of space professionals. And it's a joint activity; Navy folks come, Army folks, a handful of Marines, et cetera. And so, we have now taken that National Security Space Institute and its continuing education, and we've aligned that under the Air University, so that it's going to get mature faster, we think, with a university structure over top of it. And that's—so far, it's going well. And we will, in fact, break ground on a new building for them here in the not-too-distant future.

The second piece, though, is advanced operational training; and that, we've aligned with the Air Force Warfare Center. That will be done in Colorado Springs, because that's where the expertise is. But, this is advanced operational training that prepares our people to go forward, that prepare people for General James and his operational activities. And I'd be willing to, certainly, listen to his comment on this, as well.

But, I think we've got that aligned the right way now. And I think we've got it aligned for our future, and we are seeing that—as I look over my shoulder at the young space professionals that

are coming behind us, I think they are far better than we have ever seen before, for lots of reasons. This is some of those reasons.

Regarding the Air Force's decision to move out on the Secretary of Defense's direction to prepare for cyberspace activities, yes, the Air Force has done a couple of important things.

One is, we have decided that the major command responsibility for cyber will be in Air Force Space Command. We think there's a natural relationship there, engineeringwise, technologywise, and networkwise, where space is largely about networks. Cyber is largely about networks, and its operational business, in our view. And so, putting it under a command like Air Force Space Command made sense; standing up an operational organization—24th Air Force, which parallels General James' 14th Air Force for Space. And then, training the people, essentially paralleling the way we are training space people, I think has us on the right track for the future.

So, all those pieces, together, we did, based upon many of the things that we have done for space, and the success that we have seen in doing those.

Senator UDALL. General James, you care to comment?

General JAMES. Yes sir. On the training aspect, as General Kehler said, really, two key areas. Number one is looking at, How you grow up a space professional, and how do you get them the depth that they need to execute the mission? And I think, over the last 10 years, as we've, frankly, been executing combat operations around the world, we've gained a lot of experience to know, What do those space professionals have to know in order to support those combat operations around the globe? So, we've tailored our training to that.

The second piece, as General Kehler mentioned, is the Air Warfare Center. We've really put into the curriculum there a lot more thinking about, How do you operate in an environment where space is absolutely essential, but it will be contested? And making sure our operators understand: How do we operate in those particular environments? What sort of experiments do we need to do at the Warfare Center?—so that all of this is relevant to that combat operation around the globe.

So, we're really ramping up quite quickly with the Air Warfare Center to understand all those implications as we send people to Red Flags and the Warfare School and those sorts of things. So, we're making a lot of progress in both of those areas.

Senator UDALL. Congratulations.

I see my time's expired.

Mr. Chairman, I've got another question. Maybe after another—if we can go another round, if that works for you.

What I hear you saying is, you got outer space, you have inner space, and the two of them are definitely linked, and there are lessons that apply to both realms.

Thank you.

Senator BEN NELSON. Thank you.

General Kehler and Secretary Payton, has there been a decision as to how the fiscal year NPOESS 2010 funds and the fiscal year 2011 funds will be spent? I heard you say 2012 is where you're beginning to look, but what about 2010 and 2011?

Mr. PAYTON. Senator, the—we're going to—we would suggest continuing the industry work on the sensors and the spacecraft design and, of course, the continuing realtime operations that are going on—and algorithm development, so that when the sensor information comes down, the computers on the ground can digest it. We need to continue that work for both NASA's utility and the Air Force's utility, because in—the sensors that the Air Force will need will probably be very similar to the sensors that are under construction right now.

Senator BEN NELSON. General Kehler, do you have anything that you'd add or—

General KEHLER. No, sir. It's—in light of the decisions, some of this is still in work, some of it is still being worked out, and it's being spent the way Secretary Payton says.

Senator BEN NELSON. Admiral Dorsett and General Kehler, the committee has, for years, challenged the Department to pull together an integrated and funded satellite communications architecture. This sort of follows up on the Afghan and Iraq question. And, to date, we don't—we really don't have any architecture. And given the significant increase in the use of manned and unmanned air systems, as publicly discussed by Secretary Gates and Secretary Donley, does a strategic plan exist to address the associated significant increase in satellite communications support for these systems? And perhaps equally important, is that plan fully funded?

Admiral DORSETT. Mr. Chairman, I'm not aware that there's a plan, nor am I aware that it's fully funded. As I look at just the Navy's portion of satellite-based communications, I would say that my observation is that there's clearly a need for an integrated DOD-wide approach to space-based communications.

We, in the Navy—as I discussed earlier about our MUOS challenges, we have not even necessarily taken a completely integrated approach. The one thing that I can offer, though, is that our Chief of Naval Operations focus on networks—on information—on space—is at such a high pitch, at this point, that in our next budget deliberations, he's putting great pressure on us to focus on the networks, the coms, the flow of information. So, we are basically ramping up our focus on this.

But, across the Department, I certainly would applaud a more integrated approach. The Navy's sort of gone it alone, with the communications satellite systems and programs that we've managed previously, sir.

Senator BEN NELSON. Dr. Federici, I see you nodding approval.

Dr. FEDERICI. Well, I agree. There—to answer your question from my perspective, there is no integrated communications architect. A lot of architecture work is ongoing in different pockets of the Defense Department and the National Reconnaissance Office and elsewhere.

A lot of these architecture studies, though, in my view, are being done separate from the planning and programming and budgeting process. And somehow, we need to develop mechanisms and appropriate structures to bring those together. And there needs to be somebody that's held accountable for this to—you know, at a top level. And that's not been done yet.

Architecture work has been ongoing, but it's more architecture on paper, and it doesn't translate into budget and programs, or impact programs. It doesn't necessarily have to be a program in itself, but we really need to impact programs. It could be—it could turn to a policy, but we can't have policies that are unfunded mandates. We need to make sure the policy, if it's being derived from an architecture, is then linked to programs appropriately, and appropriately funded, as well.

Senator BEN NELSON. General Kehler?

General KEHLER. I couldn't agree more. I—we have done a series of architectures—individual architectures, over the years, for space. What we have not done is an integrated communications architecture, which is really what needs to be done, which is an air, space, and terrestrial architecture that would really pull all the pieces together. And so, work is underway to do such an architecture. That's a very difficult architecture to construct.

I can tell you that the Chief of Staff of the Air Force has looked at me recently and said—much like the Chief of Naval Operations has looked at his staff—and he has said, "I want you to come back to me with a single air, space, and terrestrial Air Force network for—one Air Force network that becomes part of the bigger architecture." But, in terms of across the Department, this is something that we know is a missing link, and something that we need to go get after.

Senator BEN NELSON. Secretary Payton, is that study that the Secretary of the Air Force is working on—will that be one of the essential elements to getting the architecture, across the board, for all the elements of air, terrestrial, and otherwise?

Mr. PAYTON. Truthfully, the first step on air, terrestrial, and space communication requirements is being led by NII within OSD—NII and the Joint Chiefs—J–8. And they're putting together something called a "bandwidth study" that looks at the total requirements—air, space, and terrestrial. And—

Senator BEN NELSON. Well, in the process of doing that, that could be the group that puts it together, but ultimately, there has to be somebody that will have responsibility for it. Would that be the—could we have that as a result of the Secretary's study—if I understand what you're explaining in Secretary Donley's study?

Mr. PAYTON. Yes. Once—but—

Senator BEN NELSON. You get both. I understand. You've got to have the architecture, then you have to have somebody that's responsible for the policy, of seeing it through?

Mr. PAYTON. To execute the—

Senator BEN NELSON. Execute it?

Mr. PAYTON.—programs and deliver the architecture. Yes, sir.

General KEHLER. And, Mr. Chairman, I don't think there's any lack of desire on the part of, certainly, not the services or others, to have such and architecture. This is really hard. This is really hard.

Senator BEN NELSON. So, even if we get somebody in place, it doesn't mean it's going to be a chip shot. Is that fair?

General KEHLER. It depends on how you shoot, sir. [Laughter.]

Senator BEN NELSON. Some days, it's good golf.

General KEHLER. Yes, sir.

Senator BEN NELSON. Going back to the Air Force. Currently, there is no funding in the Air Force budget for a technology maturation line for overhead infrared capability. At the same time, the Missile Defense Agency has included, in its budget, funds for a new infrared satellite capability for missile tracking. The age-old question: Have the Air Force and the Missile Defense Agency coordinated on the requirements and technology for the program, to your knowledge?

Mr. PAYTON. No, sir. General O'Reilly has—when he first got on the job, he came to talk to the Air Force about his ideas about this program called PTSS. We have to remember, though, that that program is for what they call "midcourse tracking," where the rocket has already burned out and is now coasting through space. That is a different sort of infrared, different mission than overhead persistent infrared, which is looking for—

Senator BEN NELSON. Taking off.

Mr. PAYTON.—hot things, and globally. The PTSS program will be looking—it will be more geographically constrained than what we can—than what we can tolerate for the overhead persistent infrared sensor systems.

Senator BEN NELSON. Okay.

Senator Udall, would you—

Senator UDALL. Thank you—

Senator Ben Nelson:—like to finish up with yours?

Senator UDALL.—Mr. Chairman.

Let me just start out by thanking Dr. Federici and Admiral Dorsett for being here.

The United States has been, is today, and will always need to be a maritime power, so my questions to the Air Force are not meant with any disrespect for the important roles that you play and the way in which you let us project force.

General Kehler, you noted that approximately 3 billion will transfer to Air Force Space Command in fiscal year '11 to grow cyberspace professionals and provide integrated cyberspace capabilities to Joint Force commanders. Could you outline how that 3 billion breaks down?

General KEHLER. Yes, sir. It's existing money, first of all. It transferred as we pulled together cyberpieces from around the Air Force. It's not new money that we've put in the direction of cyber. And so, first of all, it is largely to do those things that we have been doing for quite some time. Just as the Navy did, when they pulled together pieces of the Navy into their new organization, we pulled, largely, our communications activity—our communications and computer activities—into my command and inside 24th Air Force.

So, much of what we are doing is continuing to provide those basic network communications, computer sorts of services that we had been doing in a scattered way, throughout the Air Force, but now we've brought focus to all of that.

The other thing that we are doing is, we're revising our training activities to make sure that we are now building cyberprofessionals from the beginning who have certain prerequisites—academic prerequisites—who enter our training pipeline, who go through a deliberate preparation time, much like we do with pilots or space op-

erations people. And we are putting all of those pieces together inside air education and training command.

We are also continuing to provide expeditionary cyberforces, if you will—communications—combat communications people, who go forward—some of them are in Haiti, for example, still, as we speak; others are forward deployed in the CENTCOM area of responsibility, et cetera.

And then, of course, we are working on a new operations center, which will be part of 24th Air Force, which will be our service component to the joint cyberspace organization—Strategic Command today. And if and when we get to United States Cyber Command, 24th Air Force will be part of that. And so, that $3 billion a year does everything from purchasing long-haul communications that we have to purchase—and, by the way, the demand continues to go up—through doing our normal communications functions—deployable air traffic control systems, all of the pieces that go with that—that we've inherited as part of the new cyberbusiness.

And then, the new things that we're doing to be able to do the primary responsibility, which we have for our service in cyber, which is protecting ourselves and making sure that these intrusions that go on, while we may not be able to prevent them all or stop them all, that they don't impact our missions. And so, our focus has become a "mission assurance under duress" kind of a focus, so that we're—we can continue to operate, even in the face of these intrusions that go on.

Senator UDALL. Two comments on those points before I turn to General James for my last question. I would anticipate that, much like other areas of endeavor in the civilian arenas, that soon we will be competing—the military, that is—Federal Government—for personnel with those who have needs to protect their own assets in cyberspace, whether it be the banking system or our electricity grid and a number of other areas in which we see those sorts of threats.

And I would, second, imagine that the ideal cyberprofessional, given what I've been learning and—would be an additional asset if they spoke Russian, Chinese, Hebrew, or French, given where some of the challenges are arising right now.

You don't need to comment on that, I just—unless you'd like—

Voice: Thank you, sir.

Senator UDALL. General James, let me turn to you and talk a little bit about SSA—Situational Space Awareness. Obviously crucial for keeping our assets safe. We're relying more and more on commercial capabilities to satisfy our requirements. At the same time, those commercial providers, I understand, need to be given access to accurate Space Situational Awareness, as well. This is being done through—or was being done through the CFE, I think, right? The Commercial Foreign Entities pilot program. I understand that's been made permanent, transferred to STRATCOM. Can you update us on your efforts to make sure that we have the capacity to share that information between government and commercial satellite operators?

General JAMES. Yes, sir.

Senator UDALL. Yeah.

General JAMES. The folks that do that are out at the Joint Space Operations Center at Vandenberg Air Force Base, and that's where all the data comes in from our worldwide sensors to make sure that we can track all the objects on orbit and then do, essentially, what we "conjunction assessments," which is to determine, Is one satellite about to be hit by another piece of debris or another satellite? And over the last year, we've ramped up that capability. We were looking at about 110 satellites at the beginning of 2009, and now, at the end of 2009, we are really assessing all operational satellites—over 1100 satellites—to determine, Is there going to be a possible collision between that particular satellite and another satellite or a piece of debris?

So, we've ramped up our capability, and that's primarily in support of what was the CFE program, now called "SSA Sharing"—Space Situational Awareness Sharing—program. So, we provide on the order of, you know, hundreds of assessments a week to various owner-operators around the globe to determine whether or not there is going to be a close approach.

And, to date, over 50 satellites—owner-operators—have elected to maneuver their spacecraft, based on the data that we are providing to them. And that's commercial entities, that's foreign entities—it really cuts across the gamut. And that's what we have implemented with this Space Situational Sharing program.

We're still in the middle of determining the level of accuracy of data we can provide, because there are certain capacities that we want to protect. But, that's all ongoing, to determine how we do that. But, the owner- operators around the globe have been relying on our Joint Space Operations Center to get them that information, and it's worked very well over the last year.

Senator UDALL. How much of that debris is from the Chinese weather bird that they unnecessarily destroyed? Was that a year ago, now? Am I—

General JAMES. It's almost 2 years—

Senator UDALL. Is it 2 years ago?

Voice: It's longer.

Mr. PAYTON. January of '07.

Senator UDALL. I don't mean to sound whimsical, but I know that was—in retrospect.

General JAMES. The debris creation there was significant.

Senator UDALL. Yeah, please.

General JAMES. It was, you know—I don't remember the exact numbers, but several-percentage-point increase in the overall total of space debris in the low Earth orbit area. So, yes, sir, we manage that quite closely, to make sure that none of that's going to impact our systems.

Senator UDALL. Maybe that was a lesson to the world, as unfortunate as maybe it was, that that's not necessary, in the future, to show a capability. There are—hopefully, there are other ways to communicate with each other.

General JAMES. Yes, sir.

Senator UDALL. Thank you, Mr. Chairman.

Senator BEN NELSON. General Kehler, the Air Force has increased the budget for space situational awareness programs. Why is this important? And what happens if this request isn't fully sup-

ported? I'd like, for the record, how important this is, so that we can consider that.

General KEHLER. Well, sir, as General James just said, today, when we came here, we are tracking over 21,000 objects in Earth orbit—manmade objects—debris, pieces, or—active pieces, or those that have outlived their usefulness or become dormant in some way.

They are all—while there's a great volume of space there in which they can move, they're all traveling at a very, very high rate of speed, and as space becomes more congested, it's even more important that we understand where these objects are and what they're doing. First, we have a responsibility to help NASA understand, for human spaceflight, where this debris is and whether people are at risk. And so, General James' people draw a bubble, if you will—an imaginary bubble—around the International Space Station and around the Shuttle and other human- occupied vehicles when they're flying, to make sure that we can be very precise about what potential threats may be, because even relatively small objects traveling at those speeds—spacecraft, typically, are fairly fragile devices. And so, it's important that we understand where these objects are. First, for safety of flight. Second, to preserve capability and investment. And this an issue not only for national security purposes, but for economic purposes, as well. Where we saw the unintended collision between the Iridium satellite and the dead Cosmos—Russian Cosmos satellite—we caught a glimpse of what can happen, here, if space becomes more congested and we're not able to keep pace.

So, much of the Space Situational Awareness investment is to move us from just being able to maintain a catalog to this term that we use, called "situational awareness," which is a dynamic understanding of what is actually happening. Because the final reason that we need to make sure that we understand what's happening on orbit is so that we detect, if you will, acts that would be malicious in some way, whether they would be done as part of a conflict in the future or whether they would be done as part, maybe, of an unintended consequences, even from a maneuver that might go on.

With our investment, with the importance of what we do there, with the way, not only our warfighters, but our economy and others rely on what comes from space, it's very, very important for us to have a better and better and better awareness of what is happening in space.

And sir, I would add one more point. That also extends to cyberspace, because there is a relationship, here, between cyberspace and space, and our situational awareness in cyberspace needs to improve, as well.

Senator BEN NELSON. Let's see. Dr. Federici, the Navy's recent report on UHF augmentation is a shift from the previous approaches, and includes a revisit of commercial UHF options. This committee has supported a more aggressive approach to mitigation so that this is a welcome development. But, the question is, What implications, if any, will this decision have for the Navy's fiscal year 2011 budget? And when will you be able to provide details of the commercial options?

Dr. FEDERICI. We have looked at several options in the past. We're going to revisit those options. We're going to look at some other offerings in the next few weeks. I believe we'll want to begin something soon. We'll need to be working with your staffs, in coordinating some of our thoughts. We really have to work with Admiral Dorsett's staff, as well, on any funding in '11 that may be needed, once the—once we—once the bill is passed. So, that's something we'll need to work with your staffs on, as well.

But, it is a—an option that we'll need—that we have on the table now. We're going to press forward. We need to take a look at what those options all are. We need to do the best business-case analysis that's available, but we need to do it quickly; we need to get something underway.

We have identified, as the report mentions, a number of mitigation options, but, when we reviewed those options with the leadership—when you take all the options together, they don't really take a—give you a full capability of a single UHF. So, we really want to now explore that option. It could be a hosted payload, leased, or it could be a purchase. We want to take a look at that.

Senator BEN NELSON. Admiral Dorsett, from an operational perspective, what are your major concerns about not having adequate UHF capability and plans to develop mitigation and augmentation capacity? If you didn't have, what does that do to your operations?

Admiral DORSETT. The—I think, the—first of all, the approach that we are taking now, by looking at a commercially hosted payload, is the right approach. It reduces the risk that we otherwise would have. Last year, we made a decision that we could afford more risk, with the additional delay on the MUOS. We made a decision that we no longer could afford that risk.

It does come down to the amount—an issue of risk and how much capability your going to be able to provide to the warfighters. We're looking at this from a joint perspective, since we're providing this UHF capability for—across DOD. And we're at the point, right now, where we need to do additional mitigations.

I think today we're okay, but if there were to be any other delay in MUOS, number one, or any delays in the entire MUOS constellation, we'd be placing the Joint Force at a level of risk that, frankly, would not be appropriate.

So, I'm concerned about that, from a warfighter's point of view. I'm also concerned about it from the provider-of-the capabilities' point of view.

Senator BEN NELSON. Well, in that regard, what are your thoughts on making the DOD UHF spectrum available to encourage commercial investment in meeting the long-term government communications requirements, as well? In other words, what—do you have some thoughts about how that might work?

I have not delved into it. I think Dr. Federici would be better to answer that. I'd only make one comment, and I'd say that that is part of what we're looking at when we're looking at mitigation. You've got to put that into the calculation.

Dr. FEDERICI. That is an area we'll need to work with ASD and II on. I believe there's been precedent set in the past that that has been done; I believe, with VSAT. That is something I'll need to check, and I'll take for the record—

Senator BEN NELSON. Okay.

Dr. FEDERICI.—on that one.

[The information referred to follows]

Senator BEN NELSON. Appreciate—

Dr. FEDERICI. So, that is an issue. It's—you know, it's—you know, it's government spectrum. We'll need to share that, subject to a number of conditions. So, we'll look at that. We'll take that for action.

Senator BEN NELSON. All right. Thank you.

Well, the final question is, to each of you, What one thing keeps you awake at night or disturbs you most, when you look back over all the things we have to deal with?

Secretary Payton?

Mr. PAYTON. Truthfully—I'm sure General James will bring up what I worry about on the operational side of the world, but—the operational side of space—but, from—well, one of the things that's most frustrating to me is the space industrial base. Our costs are going up, because the number of second- and third-tier players are getting out of the space business. They are getting out because they cannot compete effectively with overseas competitors for worldwide market. So, that is increasing our costs.

I worry that eventually it may even lead to reductions in reliability. And this goes all the way from the satellite solar arrays to batteries on satellites to propulsion systems on satellites and on launch vehicles.

And so, from—the thing that worries me routinely, constantly, is the extra costs that we have to put out to redesign our systems for suppliers who are no longer there, to requalify new suppliers. And that's a pervasive, difficult problem. And our own export controls are hampering our industry.

Senator BEN NELSON. General?

General KEHLER. Mr. Chairman, there is not a single operational or mission-related item that keeps me awake at night. And that's because, in the hands of the young folks that we have operating these systems, they get the mission done. And I think, once the mission is in their hands and the hardware is in their hands, I don't worry about anything that is going on operationally.

I share Secretary Payton's concern about the industrial base. I'm not sure that that keeps me awake at night, but I do share his concern about the industrial base.

What does keep me awake at night is making sure that we can retain these marvelous young people that we have, and especially given that this is an All-Volunteer Force. Being able to retain the quality of people that we need is something that I will occasionally muse about so that I can satisfy myself that we're doing everything we possibly can to retain them. And we do, largely. But, they are in high demand, in many, many places.

And I would add that one of the ways that we are addressing that is by increasing the use of our Air Guard and our Air Force reservists. Even when people decide to move on, you know, we pat them on the back, tell them, "Thanks for your service," and we offer to hand them over to the Guard or the Reserves. And we'll have to do that with cyberprofessionals, as well. And we're having

some success with that. But, I spend a fair amount of time being concerned about retention.

Senator BEN NELSON. General James?

General JAMES. Yes, sir. From an operational perspective, again, as General Kehler said, I don't know if it keeps me up at night, but it's certainly at the top of my list, and that's understanding the expanding capabilities of all the Nation-states and actors around the globe, with respect to space. And then that gets into the Space Situational Awareness component of not only tracking objects and so on, but truly knowing what is going on in that environment. What are these objects? What is the intent of the owner? What are their capabilities? You have smaller satellites that are difficult to understand what they are doing.

So, getting not just tracking information, but situational awareness, so that, ultimately, decisionmakers can make the right decisions, should actions be required to protect our systems or to operate our systems, is really the thing that we need to continue to improve upon. And that is not only just sensors, like the Space Fence or the Space-Base Space Surveillance System, but it's also the melding of the intelligence component, because all those things need to play together in order to give, ultimately, that knowledge to the decisionmakers to allow them to have that situational awareness and make the right decisions at the right time for the Nation.

Senator BEN NELSON. Dr. Federici?

Dr. FEDERICI. Senator, the—I guess, you know, at the beginning of the session, we talked a lot about executive agency for space and the Commission report, 10—almost 9 years ago. I guess the thing now—living in acquisition for the almost 6 years that I have, and looking at a number of different acquisition programs—of course the Navy has—MUOS is, pretty much, capital program, and a couple of small acquisition programs. I think the organization and management across the Defense Department is a key issue, still. And I know it's being worked; it's on the table again. And I think clarity, more transparency would be a really, really, good thing, you know, especially for the Navy. We know all the right offices to go to, but there's several offices you need to work with, and it leads back to that question on architecture that was asked earlier. Navy really welcomes the opportunities to participate in some of the Air Force space programs, as well as the National Reconnaissance Office, you know, to participate in acquisition programs so we can continue to grow our cadre, as well. Because just having one small program office called MUOS is not enough to continue to grow a large cadre. So, we welcome that opportunity, would like to keep it.

Admiral DORSETT. Mr. Chairman, I'm concerned about the rising costs of our people and our systems, especially in the current fiscal environment and the projected fiscal environment. As the—in the future, when we no longer receive OCO supplemental funds, I am concerned. And I do lose sleep over this. I lose sleep over the potential that the Nation will not be able to afford the military that our taxpayers expect from us. These costs are pretty tremendous, and we're already seeing the stress as we're moving towards our POM–

12 program development, and I expect to see that pressure increase in the future. It is a big concern of mine.

Ms. CHAPLAIN. At GAO, of course, we're paying—

Senator BEN NELSON. I was so worried you said it's these gentlemen that keep you awake at night.

Ms. CHAPLAIN. Right. [Laughter.]

Yes, they keep me awake. And, of course, I'm paid to worry about cost—Senator Ben Nelson: Watching over us. [Laughter.]

I'm paid to worry about costs and schedule for space programs, which is more on the boring side of things, but I think, these days, we're worried about the outcomes of some of these acquisition problems, and all the capability gaps that we face, and canceled programs. And where does that leave us, going forward? How do we get from this position of being a little behind in some areas to getting back to being ahead and making sure we can be ahead? And do we have the right strategy and resources to get there? And when we have that discussion, I'd personally like to see it cut across government, cut across industry, and be very strategic.

Senator BEN NELSON. Well, thank you.

Thank you all. I appreciate it.

Once again, thank you for your service, and those that work with you, day in and day out, who wear the uniform or who are civilian, but keep us safe.

Thank you. Appreciate it.

We're adjourned.

[Whereupon, at 4:20 p.m., the subcommittee adjourned.]